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BATTERY SAVING THROUGH AMD STT2.0

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Battery Saving Through AMD STT2.0

Problem:

- In fact there exist several way to save system power (battery life) in industry, like back light control, system performance also each component's (USB/Storage/Network…) power control, but all of them need user to change their setting first since those power saving are tied with power option's setting.

  To image, if some time user is working outside with some high-power consumption work, also did not aware the battery drain is fast than usual and forget to change the power setting, it might encounter battery drain out situation.

  Here we are not to purpose a solid solution to achieve the power saving, but we extend the usage of AMD STT2.0 (System Temperature Tracking 2.0), not focus on system temperature anymore but based on current exist algorithm to extend the monitor environment to battery life as well.

Objectives:

- Monitor system battery usage
- Dynamitic APU power control based on STT interface
- Saving system power to enhance battery life

Solution:

Currently EC to monitor battery information for further notification or control are existing, so we can easy to leverage those data but just build a new algorithm for the extended usage.

AMD STT2.0 also available for now, so far this design is used for the system temperature control, easy for OEM to setting their skin temperature to enhance user experience on the system temperature. The roughly algorithm is to monitor system temperature through 2 thermal sensors, and from SMU to calculate and limited APU power in case if the temperature will over the setting.

Since STT2.0 can direct and dynamitic change the APU power to reduce the whole system temperature, therefore we can also through this interface to reduce APU power to achieve our goal to saving the system power. The easy way is EC to read the battery information back, once the remaining battery is less than our define then we can through STT to further limited power source.

Because all the CPU power parameter SMU come out will through BIOS interface to program, therefore it will not affect our thermal design for the fan table, means the fan speed will not follow by fake report change, and will honest to run at real setting.

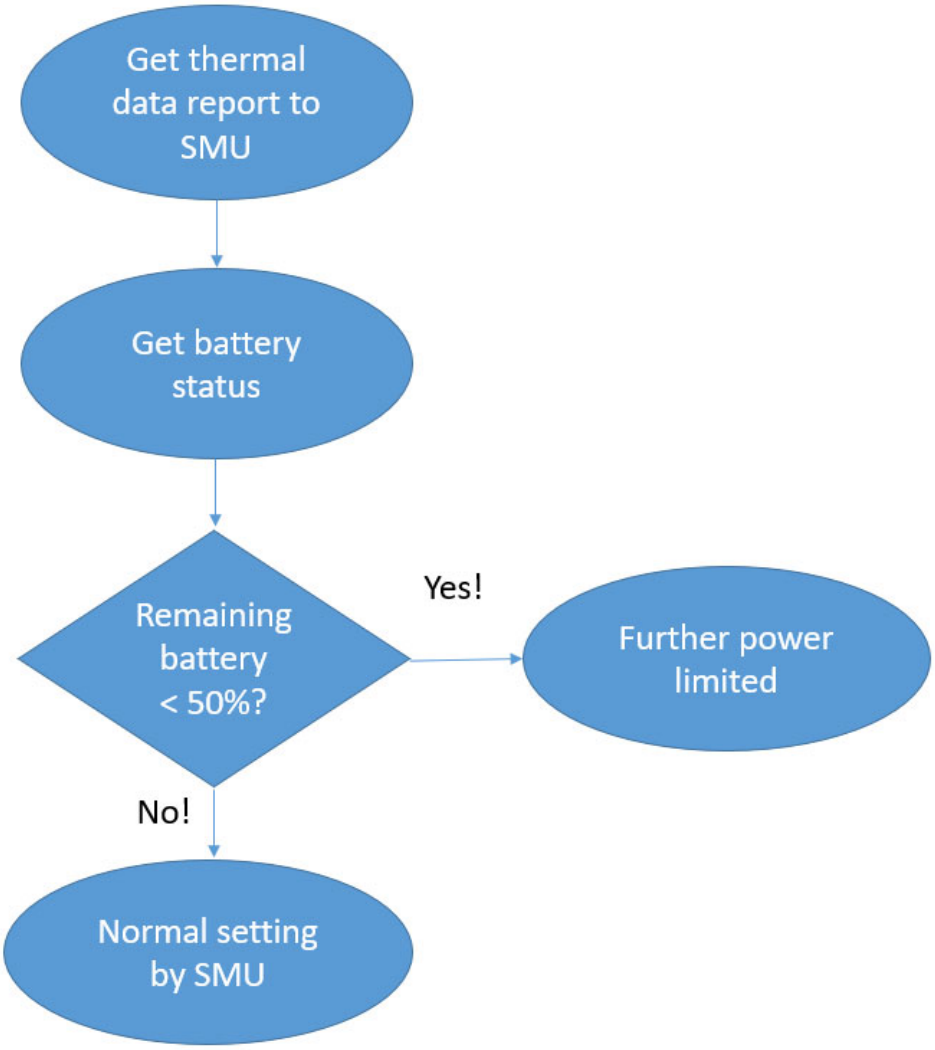
When battery life over 50% capacity all APU power limit control depend on thermal reporting, once battery life below 50% capacity we can based on real thermal temperature

increase some delta to further reduce the APU power to saving power, next page have more example to explain how it work.

Draft table for reference and can be redefine:

Remaining Battery Life	Possible Skin Temperature	Peak Power Limit by SMU	Sustain Power Limit by SMU	Comment
>50%	< 45°C	35W	15W	Normal case, all power control depends on thermal design
>50%	= 45°C	30W	15W	
>50%	> 45°C	25W	15W	
50% < > 40%	< 45°C	33W	15W	Remaining battery lower than 50%, further power limit on each scenario.
50% < > 40%	= 45°C	28W	15W	
50% < > 40%	> 45°C	23W	15W	
40% < > 30%	< 45°C	30W	15W	
40% < > 30%	= 45°C	25W	15W	
40% < > 30%	> 45°C	20W	15W	
30% < > 20%	< 45°C	25W	15W	
30% < > 20%	= 45°C	20W	15W	
30% < > 20%	> 45°C	15W	10W	
< 20%	< 45°C	20W	15W	
< 20%	= 45°C	15W	15W	
< 20%	> 45°C	10W	10W	

Flow Chart – Algorithm



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